

60M Series

Single and Dual, Programmable, Constant-Speed Wire Feeders

Index No. M/2.4
Issued Oct. 2000



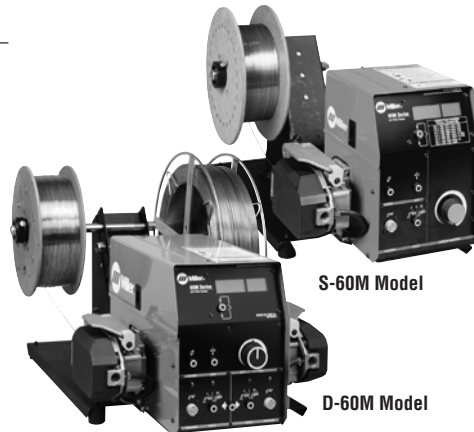
Processes



MIG (GMAW) and Pulsed MIG (GMAW-P) Welding



Flux Cored (FCAW) Welding (Gas and Self-shielded)



The 60M Series of semiautomatic wire feeders offers the ultimate in versatility and performance. Designed for pulse MIG and semiautomatic welding, all 60M models are equipped with eight synergic pulse programs. The dual models can perform the same process on both sides, or one can be used for conventional MIG, and the other used for pulsed MIG welding.

Applications

- Metal fabrication
- Heavy manufacturing
- Construction
- Light manufacturing

Features

Benefits

New! SharpArc™ Technology	An arc control that offers a simple way to tailor factory weld programs to accommodate a variety of welding applications.
New! Start/Crater Ramp	Allows the output power to be tapered from start to weld and from weld to crater.
Microprocessor-based design	Flexible system with many standard features that can be customized for a variety of applications.
Digital control	Offers precise control and regulation of the welding arc not found in conventional systems.
User-friendly front panel	One simple and easy control for setting weld parameters.
Two back-lit liquid crystal displays	Easy-to-set and view all welding parameters and selectable features.
16 built-in synergic pulse programs	Quick and easy selection of the right pulse program based on your wire and gas. Eight programs each for the Invision 456P and XMT 304.
New! Power source selectable	No setup card required for the Invision 456P or XMT 304. 16 programs are stored in the software. Just select either power source and do a system reset.
Teach mode for pulse programs	Allows easy field modification of pulse programs to meet your specific application.
Full-featured, adjustable weld sequence control	You can select and adjust any parameter within the weld sequence—preflow, run-in, weld time, crater, burnback and postflow, as required.

📖 See page 2 for additional features and benefits.

Specifications (Subject to change without notice.)

Heavy Industrial



Model	Input Power	Electrode Wire Diameter Capacity	Wire Speed	Peak Voltage Range*	Peak Current Range*	Background Current Range*	Pulses per Second*	Pulse Width*	Dimensions	Net Weight
S-60M (Single)	24 VAC 50/60 Hz	.023–1/8 in (0.6–3.2 mm)	50–780 IPM (1.3–19.8 m/min.)	0–99.9 V	100–600 A	0–200 A	20–400 PPS	1.0–5.0 Milliseconds	H: 14 in (356 mm) W: 14 in (356 mm) D: 26-1/2 in (673 mm)	58 lb (26 kg)
D-60M (Dual)									H: 14-3/4 in (375 mm) W: 18 in (457 mm) D: 32 in (813 mm)	82 lb (37 kg)

*Applies only when 60M feeders are used with the Invision® 456 and Phoenix™ 456 power sources.

Ordering Information 📖 See back page.



Miller Electric Mfg. Co.
An Illinois Tool Works Company
1635 West Spencer Street
Appleton, WI 54914 USA

International Headquarters
Phone: 920-735-4505
USA FAX: 920-735-4134
Canadian FAX: 920-735-4169
International FAX: 920-735-4125

Web Site
www.MillerWelds.com

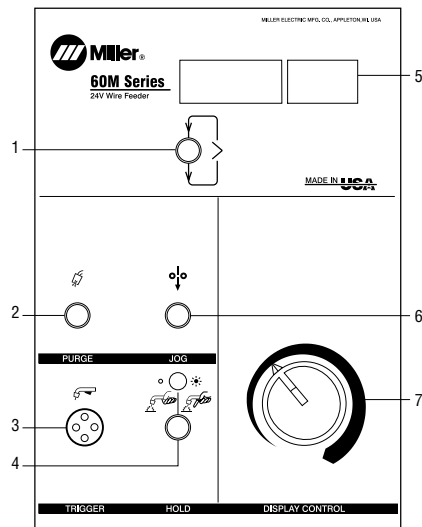


Additional Features

Benefits

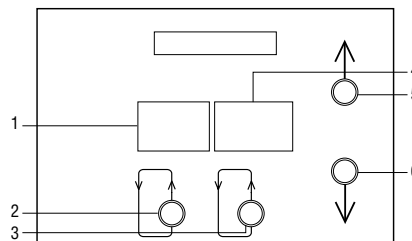
Programmable security system	Consistent results are possible by programming limits to the range of parameter adjustments. Eliminates inadvertent changes of preset parameters.
Dual schedule capabilities	Allows two separate welding conditions to be programmed for one wire.
Arc time totalizer and cycle counter	Handy feature for conducting job studies and maintenance schedules.
Electronic trigger hold control	Allows the operator to make long extended welds without holding gun trigger.
Gas purge and wire jog control	Purge gas line and feed wire without energizing system.
Quick-change drive rolls	Gear-driven drive rolls are easy to change. No tools required.
Rotatable wire drive assembly	Eliminates sharp bends in the gun cable, thus improving wire feed performance and extending the service life of the gun liner. (Bench models only.)
Sealed ball bearing, all-gear driven system	Smooth, positive and accurate wire feed offers long, uninterrupted service life.
Posifeed™ wire drive system	Four drive roll provides excellent feeding of welding wire.

Control Panels



60M Series Front Panel

1. Parameter Select. Controls the selection of voltage or arc length, wire feed speed, program number, and also SharpArc™.
2. Purge Button. Purges gas line and gun without energizing feeder.
3. Gun Trigger Receptacle. Prewired for single- and dual-schedule operation. Receptacle will accommodate a variety of dual schedule switches.
4. Trigger Hold Button and Light. System remains energized when operator releases gun trigger—ideal when making extended welds.
5. Digital Display
6. Jog Button. Feeds wire without energizing the power source contactor and gas valve. (Independent control)
7. Display Control. Single-knob control for setting all adjustable, displayed parameters.



60M Series Side Panel

1. Mode Displays.
2. Mode Select Button. Provides choice of four modes:
 - Process Mode. (Pulse, adaptive pulse, or MIG.) Also used to teach customized pulse programs.
 - Sequence Mode. Allows variety of sequences in weld program. (Refer to Sequence Chart.)
 - Dual Schedule Mode. Links two weld programs when two different welding conditions are required for one wire.
 - Card Mode. Writes programs to optional Data Card or reads programs from the Data Card.
3. Parameter Select Button. Selects parameter to be changed.
4. Parameter Display
5. Parameter Increase Button
6. Parameter Decrease Button

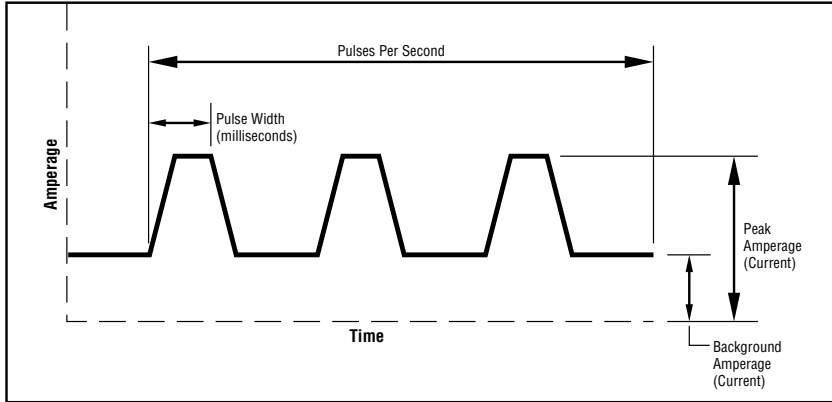
Sequence Chart			
Sequence	Time	Wire Feed Speed	Voltage or Trim
Preflow	0–9.9 sec.	not active during preflow	not active during preflow
Run-in	not active during run-in	adjustable	not active during run-in
Start	0–2.5 sec.	adjustable	adjustable
Weld*	0–25 sec.	adjustable	adjustable
Crater	0–2.5 sec.	adjustable	adjustable
Burnback	0–0.25 sec.	not active during burnback	adjustable (voltage only)
Postflow	0–9.9 sec.	not active during postflow	not active during postflow

*Inductance is adjustable in the MIG process mode only when using the Invision or Phoenix 456 power source.

Description of Pulsed MIG Welding Process

When pulsed MIG welding, the power source rapidly switches the output from high peak current to low background current in precisely regulated intervals. The peak current pinches off a spray-transfer droplet while the low background current “cools” the arc with little or no

metal transfer. With proper adjustment of the pulse parameters, the pulsed MIG welding process can produce high-quality welds when using a broad range of material types, thicknesses, and joint configurations. Requires use of a Miller inverter power source.



Pulsed MIG Wave Form

Advantages of Pulsed MIG Process over MIG Spray Transfer and Short Arc Welding

- Can use larger, more economical wire diameters
- Reduces or eliminates spatter
- Lower heat input; therefore, reduced distortion
- Better out-of-position puddle control
- Optimum bead shape and penetration
- Potential reduction in fume particulate emission

Note: For additional pulsed MIG information, order Miller Electric's GMAW-P Pulsed Spray Transfer Process Guide (#168 336).

A 4-volume video training package (#175 773) is also available.

- What is Pulsed MIG Welding?
- Pulsed MIG Process Variables
- Pulsed MIG Equipment and Set-Up
- Pulsed MIG Operator Techniques

Includes Pulsed Spray Transfer Process Guide (#168 336)

60M Design Features

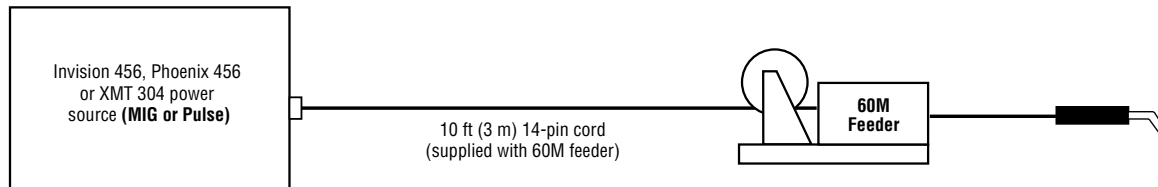
- Can be used with a variety of Miller power sources :
For pulsed MIG/conventional MIG welding use the 60M with the Invision™ 456, Phoenix™ 456 CC/CV, or the XMT®304 CC/CV inverter power source.
For conventional MIG welding only, the 60M can also be used with the Deltaweld® or Dimension™ Series power source.

Programming Features

- Eight Synergic Pulsed MIG Programs factory-set for use with the XMT®304 welding power source:
 - Mild steel wire with Argon/CO₂ shielding gas**
 - (1) .030 in (0.8 mm)
 - (2) .035 in (0.9 mm)
 - (3) .045 in (1.1 mm)
 - Stainless steel wire with Argon/Helium/CO₂ shielding gas**
 - (4) .030 in (0.8 mm)
 - (5) .035 in (0.9 mm)
 - (6) .045 in (1.2 mm)
 - Nickel alloy wire with Argon/Helium shielding gas**
 - (7) .035 in (0.9 mm)
 - Metal core wire with Argon/CO₂ shielding gas**
 - (8) .045 in (1.2 mm)
- Eight Synergic Pulsed MIG Programs factory-set for use with the Invision™ 456 welding power source:
 - Mild steel wire with Argon/CO₂ shielding gas**
 - (1) .035 in (0.9 mm)
 - (2) .045 in (1.2 mm)
 - (3) .052 in (1.3 mm)
 - (4) .062 in (1.6 mm)
 - Stainless steel wire with Argon/Helium/CO₂ shielding gas**
 - (5) .035 in (0.9 mm)
 - (6) .045 in (1.2 mm)
 - Metal core wire with Argon/CO₂ shielding gas**
 - (7) .045 in (1.2 mm)
 - (8) .052 in (1.3 mm)
- On-Board Programming and Diagnostics:
 - All factory-set synergic pulse programs can be modified to meet specific welding applications
 - Feeder can be manually programmed for the voltage and/or amperage range of the power source being used
 - Automatic shutdown if arc voltage is not detected when gun trigger is depressed
 - Automatic shutdown if no wire feed speed is present when the gun trigger is pressed
 - Drops out contactor and gas valve if arc is not sensed after 3 seconds
- Selectable Operating Features:
 - Feeder will compensate for variations in tip-to-work distance and provide a constant arc length (in Adaptive Pulse mode)
 - Arc voltage can be regulated at the power source output studs or at the welding gun
 - Gun trigger can be used to make program selection
 - Arc time counter accumulates and displays actual arc time (up to 9,999.99 hours) and weld cycles (up to 999,999 cycles). Counter can be reset to 0 (zero) as required. Ideal for job time studies, shift output, maintenance, etc.
- Security Capabilities:
 - Feeder can be programmed to limit the range of parameter control, the number of programs available, and the selectable parameters that are available to the operator
 - A three-digit code can be programmed to restrict unauthorized access to the set-up screen

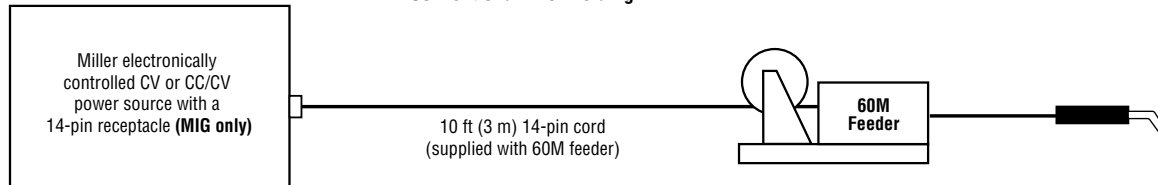
Typical Installations

Pulsed MIG or Conventional MIG Welding







Note: To connect the 60M feeder to an existing Maxtron™ 450 power source use adapter cord #043 661.

Conventional MIG Welding



Four Roll Drive Roll Kits (Order from Miller Service Parts.)

Select drive roll kits from chart below according to type and wire size being used. Drive roll kits include necessary guides and feature an anti-wear sleeve for the inlet guide.

Wire size	"V" groove for hard wire 	"U" groove for soft wire or soft-shelled cored wires 	"V" knurled for hard-shelled cored wires 	"U" clogged for extremely soft wire or soft-shelled cored wires (i.e., hard facing types) 
.035 in (0.9 mm)	#151 026	#151 036	#151 052	—
.040 in (1.0 mm)	#161 190	—	—	—
.045 in (1.1/1.2 mm)	#151 027	#151 037	#151 053	#151 070
.052 in (1.3/1.4 mm)	#151 028	#151 038	#151 054	#151 071
1/16 in (1.6 mm)	#151 029	#151 039	#151 055	#151 072
.068/.072 in (1.8 mm)	—	—	#151 056	—
5/64 in (2.0 mm)	—	#151 040	#151 057	#151 073
3/32 in (2.4 mm)	—	#151 041	#151 058	#151 074
7/64 in (2.8 mm)	—	#151 042	#151 059	#151 075
1/8 in (3.2 mm)	—	#151 043	#151 060	#151 076

Nylon Wire Guides for Feeding Aluminum Wire

(Order from Miller Service Parts.)

Wire Size	Inlet Guide	Intermediate Guide
.047 in (1.2 mm)	#151 203	#151 204
1/16 in (1.6 mm)	#151 205	#151 206
3/32 in (2.4 mm)	#151 207	#151 208

Note: "U" groove drive rolls are recommended when feeding aluminum wire.

Wire Guides

Wire Size	Inlet Guide	Intermediate Guide
.023 – .040 in (0.6 – 1.0 mm)	#150 993	#149 518
.045 – .052 in (1.1 – 1.4 mm)	#150 994	#149 519
1/16 – 5/64 in (1.6 – 2 mm)	#150 995	#149 520
3/32 – 7/64 in (2.4 – 2.8 mm)	#150 996	#149 521
1/8 in (3.2 mm)	#150 997	#149 522

Options

Skill Level Index

The bracketed entry to the right of the stock number of field-installed options contains a letter and number. The letter indicates the skill level required to install the option. The number indicates the approximate time required for installation (see legend).

A – Easy. No previous experience needed.

B – Average. Requires removal of service panels. Mechanical ability is helpful.

C – Difficult. May require the use of an ohmmeter and/or splicing of electrical wires. Repair or replacement of component parts is more difficult.

D – Technical. May require the use of an ohmmeter and the ability to read a circuit diagram. Repair or replacement of component parts is complex.

Example:

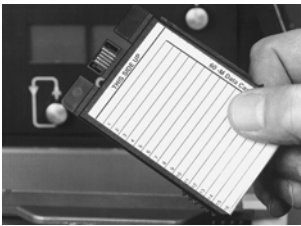
[B: 30] Skill Level: B, Time: 30 minutes

Cord, Y-Adapter 24V #043 387

Connects an old feeder to a new power source.

Weld Current Sensor #160 963 [A: 05]

This option is required when using M feeders with older style Miller CV power sources: Deltaweld® prior to serial no. KG141349 and Dimension™ prior to serial no. KC 253517.



Blank Data Card #155 910

Stores up to 32 complete weld programs. Ideal for saving custom programs and transferring programs to other 60M feeders.

Digital Gas Flow Meter #186 313 [B: 15]

Allows gas flow rate (CFH) to be accurately set on the 60M front panel digital display. A programming feature in the 60M control allows a selectable gas range to be set and if for any reason the gas flow deviates from the set range the system will shut down and display a “GAS FLOW ERROR” on the 60M front panel display. This can be an excellent gas saver and will also alert to a low gas supply.

New! SharpArc™ Upgrade Kit #191 996 [A: 15]

This kit allows 60M feeders manufactured prior to serial no. KJ218744 to be upgraded to include the SharpArc feature.

Automation Upgrade Module

#172 886 [B: 15]

This module consists of an I/O board and software upgrade that enables the 60M control to better communicate with other peripheral equipment and improves performance in an automatic welding cell.

Features: two programmable outputs, remote start/stop, remote program select, arc voltage monitor, arc error monitor and wire stick check.

Water Flow Shutdown Switch

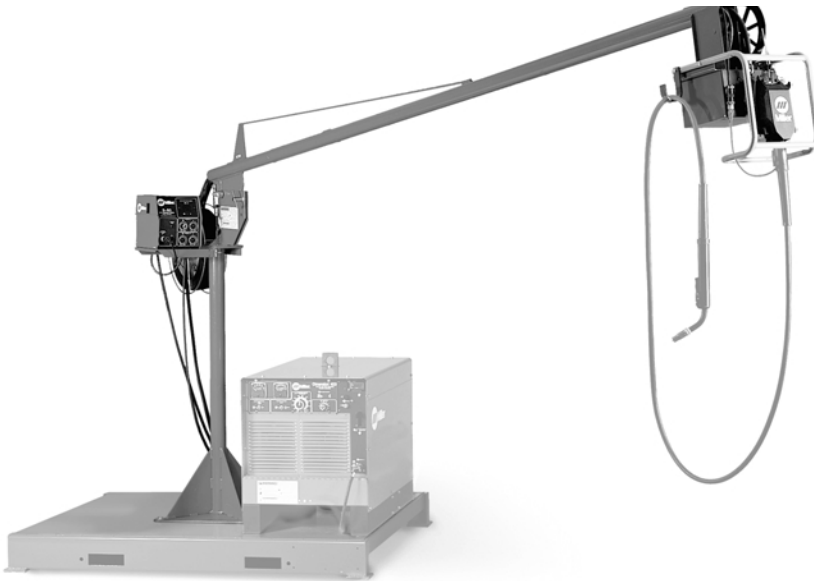
#180 390 [A: 15]

For use with the water hose kits. Protects water-cooled gun from overheating by shutting down system if water does not flow.

If required on both sides of a dual model, two water flow shutdown switches must be ordered.

Swingarc™ Boom-Mounted Wire Feeders

Swingarc boom-mounted semiautomatic wire feeders bring an extra dimension of flexibility and efficiency to high-production wire welding stations. You get an effective solution that maximizes output, especially when dealing with large weldments and hard-to-reach areas. See Lit. Index No. M/13.0.



Accessories



Control Detachment Kit

For S-60M model

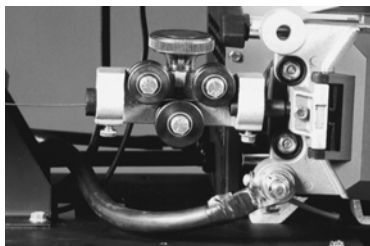
#134 936 Field 10 ft (3 m) [B: 55]

#134 937 Field 25 ft (7.6 m) [B: 55]

For D-60M model

#134 935 Field 25 ft (7.6 m) [B: 55]

For 60M bench models only. Separates the feeder control module from the wire drive assembly and base. Ideal when using Automation Upgrade Module.



Wire Straightener

For .035–.045 in (0.9–1.1 mm) wire

#141 580 [A: 05]

For 1/16–1/8 in (1.6–3.2 mm) wire

#141 581 [A: 05]

Reduces cast in wire. Improves wire feeding performance and increases life of gun liner and contact tip.

Dual Schedule Switches

For use with dual schedule control. Dual schedule switches require adapter cord #157 364.



DSS-8 #079 693 [A: 05]

A 15 ft two-position trigger switch that easily attaches to the welding gun. Use in place of the standard trigger for dual scheduling.



DSS-9M #041 793 [A: 05]

A 15 ft, two-position slide switch that attaches to the welding gun. Selects welding condition when utilizing the dual schedule feature. Gun trigger operates as standard trigger.



DSS-10 Remote Increase/Decrease Switch

#042 749 [A: 05]

A 15 ft, two-position, momentary contact switch that attaches to the welding gun. Use with the Remote Parameter Increase/Decrease feature to fine tune parameters at the welding gun while welding. Gun trigger operates as standard trigger.

Adapter Cord #157 364

A 1 ft, Y trigger cable that connects DSS switch and control box to the gun. Required for use with dual schedule switches.



Wire Reel Assembly #108 008

Accommodates 60 lb (27 kg) coil of wire.

Reel Covers

For S-60M and left side of D-60M model
#058 256

For right side of D-60M model
#091 668

Accommodates 60 lb (27 kg) coil of wire. Protects wire from contaminants.



Spool Covers

For S-60M and left side of D-60M model
#057 607 [A: 05]

For right side of D-60M model
#090 389 [A: 05]

Fits a 12 in (304 mm) spool of wire.

Guns

M-40 Guns

See Lit. Index No. M/10.0.

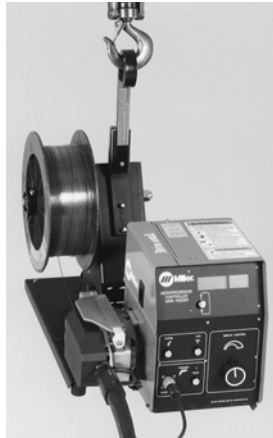
Accessories



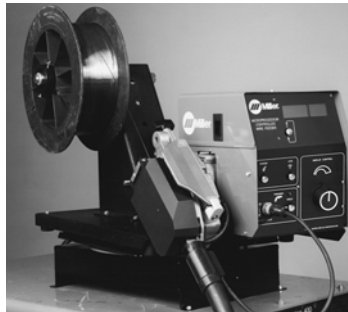
Carrying Cart #056 301 [A: 30]
Carries wire feeder and miscellaneous welding supplies. Height: 34 in (863 mm). Lower tray height: 9 in (228 mm). Shipped disassembled.



Feeder Cart #142 382 [A: 20]
Low-profile, creeper cart. Shipped disassembled.



Hanging Bail #058 435 [A: 15]
Electrically isolated. Suspends feeder over work area.



Turntable Assembly #146 236 [B: 20]
Allows feeder to rotate as operator changes work position. Reduces strain and bending of gun cable.

14-Pin Extension Cords

#043 690 25 ft (7.6 m)

#043 691 50 ft (15 m)

For optimum performance, do not extend 60M feeder more than 60 ft (18 m) from power source.

Water Coolant Systems

For more information, see Miller Coolant Systems Lit. Index No. AY/7.2.



Coolmate 3

#043 007 115 VAC

#043 008 230 VAC

For use with water-cooled torches rated up to 600 amps. Unique paddle-wheel indicator, external filter and easy-fill spout.

Coolmate V3 #043 009 115 VAC

For use with water-cooled torches rated up to 500 amps. Vertical design conveniently mounts to Miller cylinder rack in place of one cylinder.

Coolmate 4 #042 288

For use with water-cooled torches rated up to 600 amps. Tough molded polyethylene case with carrying handle.

Coolant #043 810

Sold in cases of four 1-gallon recyclable plastic bottles. Miller coolants contain a base of ethylene glycol and deionized water to protect against freezing to -37°F (-38°C) or boiling to 227°F (108°C). Also contains a compound that resists algae growth.

Water Hose Kit

#096 746 10 ft (3 m) [A: 10]

For 60M bench models only. Use with Miller coolant systems and water-cooled welding guns. Can be used with or without optional water flow safety switch.

If water kit is to be used on both sides of a dual wire feeder, a kit must be ordered for each side of the feeder.

Recommended Power Sources

MIG or Pulsed MIG

Invision® 456P	Lit. Index No. DC/20
XMT®304 CC/CV	Lit. Index No. DC/18.8
Phoenix™ 456	Lit. Index No. DC/21

MIG only

Deltaweld®	Lit. Index No. DC/16.2
Dimension™	Lit. Index No. DC/19.2

Ordering Information and System Checklist

Equipment and Options	Stock No.	Description	Qty.	Price
60M Wire Feeder <i>Note: Drive rolls must be ordered separately.</i>	#131 794*	S-64M, single		
	#131 794-01-3	S-64M, single, with high speed motor		
	#131 796*	D-64M, dual		
	#131 796-02-1	D-64M, dual, with high speed motor (both sides)		
	#131 794-02-2	S-64M, with CE, Europe		
#131 794-03-2	S-64M, with CE, Euro-French			
Drive Roll Kit		See table on page 4		
Wire Guides		See table on page 4		
Weld Current Sensor	#160 963	For use with older-style Miller power sources		
Blank Data Card	#155 910	Store up to 32 programs		
E-Prom /French Field Option	#198 564			
Digital Gas Flow Meter	#186 313			
SharpArc Upgrade Kit	#191 996	For 60M feeders prior to serial No. KJ218744		
Automation Upgrade Module	#172 886			
Water Flow Shutdown Switch	#180 390	Use with water hose kit #096 746		
Swingarc Boom-Mounted Feeders		See Lit. Index No. M/13.0		
Accessories				
Control Detachment Kit	#134 936	Field. For S-60M, 10 ft		
	#134 937	Field. For S-60M, 25 ft		
	#134 935	Field. For D-60M, 25 ft		
Wire Straightener	#141 580	.035-.045 in wire		
	#141 581	1/16-1/8 in wire		
DSS-8	#079 693	Dual schedule switch		
DSS-9M	#041 793	Dual schedule switch		
DSS-10	#042 749	Remote increase/decrease switch		
Adapter Cord	#157 364	1 ft (0.3 m). For use with Dual Schedule Switches		
PSA-2 Control	#141 604			
Wire Reel Assembly	#108 008			
Reel Covers	#058 256	For S-60M and left side of D-60M		
	#091 668	For right side of D-60M		
Spool Covers	#057 607	For S-60M and left side of D-60M		
	#090 389	For right side of D-60M		
M-40 Welding Guns		See Lit. Index No. M/10.0		
Carrying Cart	#056 301			
Feeder Cart	#142 382			
Hanging Bail	#058 435			
Turntable Assembly	#146 236			
Adjustable Spool Carrier	#096 075			
14-Pin Extension Cords	#043 690	25 ft (7.6 m)		
	#043 691	50 ft (15.2 m)		
Coolmate™ 3	#043 007	115 VAC		
	#043 008	230 VAC		
Coolmate™ V3	#043 009			
Coolmate™ 4	#042 288	115 VAC		
Coolant	#043 810			
Water Hose Kit	#096 746			
Swingarc™ Mounting Equipment		See Lit. Index No. M/13.0		
Miscellaneous				
Primary Power Cable				
International-Style Connector	#138 181	For 4/0 weld cable. <i>Two required when pulsing using Miller inverter power sources</i>		
Ground Cable with Work Clamp				
Gas Supply				
Regulator/Flowmeter				
Welding Wire				
Spare Consumables				
Helmet/Welding Gloves				
Date:			Total Quoted Price:	

*  Certified by Canadian Standards Association to both Canadian and U.S. Standards.

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